

## TEST REPORT

IEC/EN 60 335-2-30 & 60335-2-43

Safety of household and similar electrical appliances

Part 2: Particular requirements for room heaters, clothes dryers and towel rails

Report Reference No. ....: 702587-01/01-M1

Date of issue .....: 18.11.2008

Total number of pages .....: 18

CB/CCA Testing Laboratory .....: Electrotechnical Testing Institute

Address .....: Pod Lisem 129, 171 02 Praha 8 – Troja, Czech Republic

Applicant's name .....: KORADO a.s.,

Address .....: Bří Hubálků 869, 560 02 Česká Třebová 2, Czech Republic

### Test specification:

Standard .....:  IEC 60335-2-30:2002 + A1:2004  
 IEC 60335-2-43:2002 + A1:2005  
 IEC 60335-1:2001 (incl. Corrigendum 1:2002)+A1:2004+A2:2006  
(incl. Corrigendum 1:2006) and/or  
 EN 60335-2-30:2003+A1:2004  
 EN 60335-2-43:2003+A1:2006  
 EN 60335-1:2002+A1:2004+A11:2004+A12:2006+A2:2006  
 EN 50366:2003+A1:2006

Test procedure .....: CB / CCA

Non-standard test method .....: N/A

Test Report Form No. ....: IECEN60335\_2\_30 & 43

Test Report Form(s) Originator. ....: VDE

Master TRF .....: Dated 2007-06

Test item description .....: Tubular radiator and clothes towel rails

Trade Mark .....: KORADO

Manufacturer .....: KORADO a.s., Bří Hubálků 869, 560 02 Česká Třebová 2, Czech Republic

Model/Type reference .....: see table page 3

Ratings .....: 230V~ max.900W IP 44 ( see table page 3 )

### Testing procedure and testing location:

**CB/CCA Testing Laboratory:**

Testing location/ address .....: Electrotechnical Testing Institute  
Pod Lisem 129, 171 02 Praha 8 – Troja, Czech Republic

**Associated CB Laboratory:**

Testing location/ address .....: Electrotechnical Testing Institute  
Pod Lisem 129, 171 02 Praha 8 – Troja, Czech Republic

Tested by (name + signature) .....: Pfařová Dana

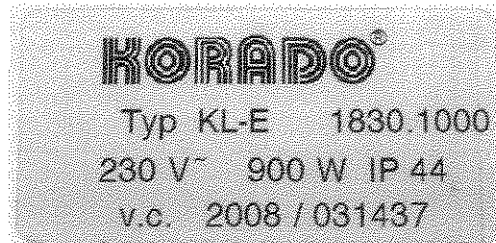
Approved by (+ signature) .....: Ungrman Petr

**Summary of testing:****Tests performed (name of test and test clause):**

*Partial test to cl.10,11,13,19, 27 were performed on the type KL-E 1830.1000 with heating element type EI.05MgO.*

*Basic Test Report for tubular radiator and clothes towel rails no.702587-01/01.*

*Basic Test Report for heating element type EI.05MgO no. 802422-01/01.*

**Copy of marking plate**

## Diferences of types

## KORALUX LINEAR-E (KL-E)

| Type            | Rated voltage (V) | Rated power input (W) | IP code | Dimensions (mm) |
|-----------------|-------------------|-----------------------|---------|-----------------|
| KL- E 780.450   | 230 V~            | 200                   | IP 44   | 780x450x35      |
| KL- E 780.600   | 230 V~            | 200                   | IP 44   | 780x600x35      |
| KL- E 780.750   | 230 V~            | 300                   | IP 44   | 780x750x35      |
| KL- E 780.1000  | 230 V~            | 400                   | IP 44   | 780x1000x35     |
| KL- E 1200.450  | 230 V~            | 300                   | IP 44   | 1200x450x35     |
| KL- E 1200.600  | 230 V~            | 400                   | IP 44   | 1200x600x35     |
| KL- E 1200.750  | 230 V~            | 500                   | IP 44   | 1200x750x35     |
| KL- E 1200.1000 | 230 V~            | 600                   | IP 44   | 1200x1000x35    |
| KL- E 1830.450  | 230 V~            | 400                   | IP 44   | 1830x450x35     |
| KL- E 1830.600  | 230 V~            | 600                   | IP 44   | 1830x600x35     |
| KL- E 1830.750  | 230 V~            | 700                   | IP 44   | 1830x750x35     |
| KL- E 1830.1000 | 230 V~            | 900                   | IP 44   | 1830x1000x35    |

## KORALUX RONDO CLASSIC-E (KRCE)

|               |        |     |       |             |
|---------------|--------|-----|-------|-------------|
| KRCE 500.735  | 230 V~ | 200 | IP 44 | 500x735x82  |
| KRCE 900.535  | 230 V~ | 200 | IP 44 | 900x535x70  |
| KRCE 900.735  | 230 V~ | 300 | IP 44 | 900x735x82  |
| KRCE 1100.535 | 230 V~ | 300 | IP 44 | 1100x535x70 |
| KRCE 1100.735 | 230 V~ | 400 | IP 44 | 1100x735x82 |
| KRCE 1500.535 | 230 V~ | 400 | IP 44 | 1500x535x70 |
| KRCE 1500.735 | 230 V~ | 600 | IP 44 | 1500x735x82 |

## Diferences of types

**KORALUX LINEAR CLASSIC-E (KLCE)**

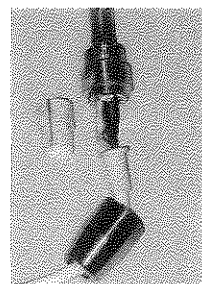
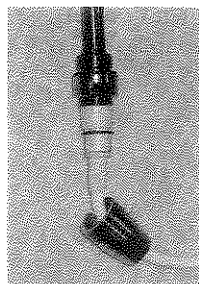
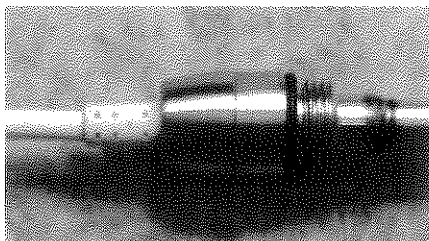
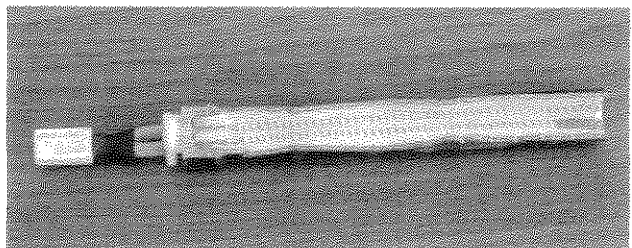
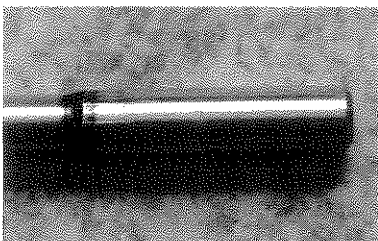
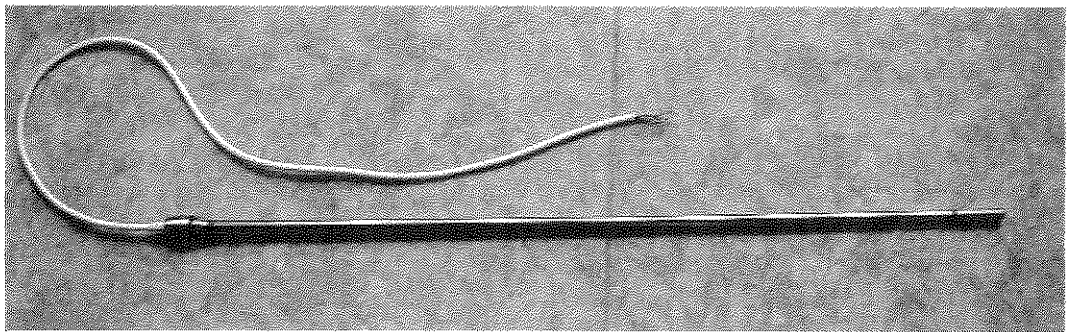
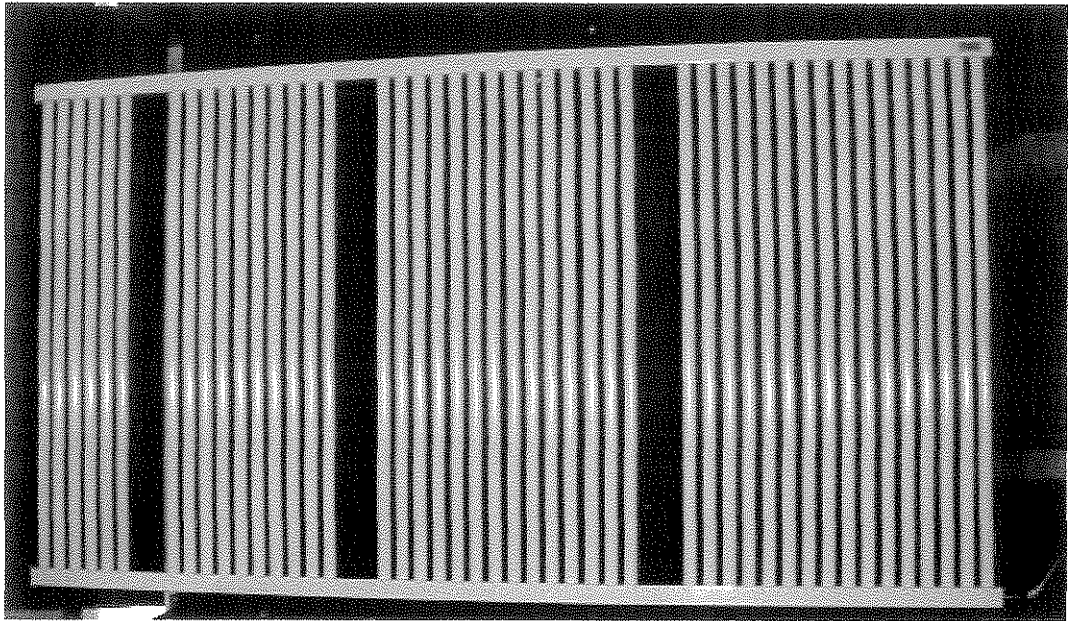
| Type          | Rated voltage (V) | Rated power input (W) | IP code | Dimensions (mm) |
|---------------|-------------------|-----------------------|---------|-----------------|
| KLCE 930.450  | 230 V~            | 200                   | IP 44   | 930x450x30      |
| KLCE 930.600  | 230 V~            | 200                   | IP 44   | 930x600x30      |
| KLCE 930.750  | 230 V~            | 300                   | IP 44   | 930x750x30      |
| KLCE 1340.450 | 230 V~            | 300                   | IP 44   | 1340x450x30     |
| KLCE 1340.600 | 230 V~            | 400                   | IP 44   | 1340x600x30     |
| KLCE 1340.750 | 230 V~            | 500                   | IP 44   | 1340x750x30     |
| KLCE 1675.450 | 230 V~            | 400                   | IP 44   | 1675x450x30     |
| KLCE 1675.600 | 230 V~            | 500                   | IP 44   | 1675x600x30     |
| KLCE 1675.750 | 230 V~            | 600                   | IP 44   | 1675x750x30     |

**KORALUX RONDO-E (KR-E)**

|                |        |     |       |             |
|----------------|--------|-----|-------|-------------|
| KR- E 780.450  | 230 V~ | 200 | IP 44 | 780x750x66  |
| KR- E 780.600  | 230 V~ | 300 | IP 44 | 780x600x76  |
| KR- E 780.750  | 230 V~ | 300 | IP 44 | 780x750x86  |
| KR- E 1200.450 | 230 V~ | 300 | IP 44 | 1200x450x66 |
| KR- E 1200.600 | 230 V~ | 400 | IP 44 | 1200x600x76 |
| KR- E 1200.750 | 230 V~ | 500 | IP 44 | 1200x750x86 |
| KR- E 1830.450 | 230 V~ | 400 | IP 44 | 1830x450x66 |
| KR- E 1830.600 | 230 V~ | 600 | IP 44 | 1830x600x76 |
| KR- E 1830.750 | 230 V~ | 800 | IP 44 | 1830x750x86 |



Type KL- E 1830.1000



## IEC/EN 60335-2-30 &amp; 60335-2-43

| Clause | Requirement - Test   | Result - Remark                         | Verdict |
|--------|--|---|---------|
| 10     | POWER INPUT AND CURRENT  |   |         |
| 10.1   | Power input at normal operating temperature, rated voltage and normal operation not deviating from rated power input by more than shown in table 1   | (See appended table)                    | P       |
| 10.2   | Current at normal operating temperature, rated voltage and normal operation not deviating from rated current by more than shown in table 2   | (See appended table)                    | N/A     |
| 11     | HEATING  |   |         |
| 11.1   | No excessive temperatures in normal use  |   | P       |
|        | Towel rails are also subjected to the test of 11.101(IEC/EN 60335-2-43)  |   | P       |
| 11.2   | Placing and mounting of appliance in the test corner as described (IEC/EN 60335-2-30)  | installed according to the instructions | P       |
| 11.3   | Temperature rises, other than of windings, determined by thermocouples   |   | P       |
|        | Temperature rises of windings determined by resistance method, unless  |   | N/A     |
|        | the windings makes it difficult to make the necessary connections  |   | N/A     |
|        | Temperature rise of felt pad is determined by thermocouples with disks of cooper. (IEC/EN 60335-2-30)  |   | N/A     |
| 11.4   | Heating appliances and heating elements operated under normal operation at 1,15 times rated power input .....  | 1035W                                   | P       |
|        | If the temperature rise limits are exceeded in appliances incorporating motors, transformers or electronic circuits and the power input is lower than the rated power input, the test is repeated with the appliance supplied at 1,06 times rated voltage. (IEC/EN 60335-2-30) , (IEC/EN 60335-2-43) |   | N/A     |
| 11.5   | Motor-operated appliances operated under normal operation at most unfavourable voltage between 0,94 and 1,06 times rated voltage ... (IEC/EN 60335-2-30)   |   | N/A     |
| 11.6   | Combined appliances are tested as heating appliances (IEC/EN 60335-2-30), (IEC/EN 60335-2-43)  |   | N/A     |
| 11.7   | Appliances operated until steady conditions are established (IEC/EN 60335-2-30), (IEC/EN 60335-2-43)   |   | P       |
| 11.8   | Temperature rises not exceeding values in table 3  | (See appended table)                    | P       |

| Clause | Requirement - Test  | Result - Remark      | Verdict |
|--------|---|----------------------|---------|
|        | Protective devices do not operate, except   |                      | P       |
|        | components in protective electronic circuits tested for the number of cycles specified in 24.1.4 (IEC/EN 60335-1/A1)  |                      | N/A     |
|        | Sealing compound does not flow out  |                      | P       |
|        | For heaters intended to be fixed under benches, the temperature rise of surfaces accessible to the test rod shall not exceed the limits specified in Table 3 for parts that are held for short periods only (IEC/EN 60335-2-30) |                      | P       |
|        | Temperature rise of textile not exceeding 75 K (IEC/EN 60335-2-43)  |                      | P       |
|        | Temperature rise limits of motors, transformers or components of electronic circuits and other parts may be exceeded by 1.15 times rated power input (IEC/EN 60335-2-30) (IEC/EN 60335-2-43)                                    |                      | N/A     |
| 11.101 | Towel rails operated at rated power input but without textiles (IEC/EN 60335-2-43)  |                      | P       |
|        | Temperature rises of the surface not exceeding the following values (IEC/EN 60335-2-43) :   |                      | P       |
|        | metal and painted metal surfaces:   | < 60K                | P       |
|        | vitreous enamelled metal surfaces:  | < 65K                | N/A     |
|        | glass and ceramic surfaces:   | < 70K                | N/A     |
|        | plastic surfaces exceeding 0,3 mm thick:  | < 85K                | N/A     |
| 13     | <b>LEAKAGE CURRENT AND ELECTRIC STRENGTH AT OPERATING TEMPERATURE</b>   |                      |         |
| 13.1   | Leakage current not excessive and electric strength adequate  |                      | P       |
|        | Heating appliances operated at 1.15 times rated power input..... :  | 1035W                | P       |
|        | Motor-operated appliances and combined appliances supplied at 1,06 times rated voltage..... :   |                      | N/A     |
|        | Protective impedance and radio interference filters disconnected before carrying out the tests  |                      | N/A     |
| 13.2   | Leakage current measured by means of the circuit described in figure 4 of IEC 60990   |                      | P       |
|        | Leakage current measurements  | (See appended table) | P       |
| 13.3   | The appliance is disconnected from the supply   |                      | P       |
|        | Electric strength tests according to table 4  | (See appended table) | P       |
|        | No breakdown during the tests   |                      | P       |



| Clause | Requirement - Test   | Result - Remark | Verdict |
|--------|--|-----------------|---------|
| 19     | ABNORMAL OPERATION   |                 |         |
| 19.1   | The risk of fire or mechanical damage under abnormal or careless operation obviated  |                 | P       |
|        | Electronic circuits so designed and applied that a fault will not render the appliance unsafe  |                 | N/A     |
|        | Appliances incorporating contactors or relays subjected to the test of 19.14, being carried out before the tests of 19.11 (IEC/EN 60335-1/A2)  |                 | N/A     |
|        | For each of the tests, news textiles are used (IEC/EN 60335-2-43)  |                 | P       |
| 19.2   | Test of appliance with heating elements with restricted heat dissipation; test voltage (V): power input of 0,85 times rated power input .....  | 765W            | P       |
|        | For appliances having a heated surface which supports the textiles, eight layers of textiles are used (IEC/EN 60335-2-43)  |                 | P       |
|        | Two layers of textiles are placed on the heating element guard or over the air inlet (IEC/EN 60335-2-43)   |                 | N/A     |
|        | The test is carried out with the textiles completely covering the guard or air inlet and then with the textiles covering 80% of the area of the guard or air inlet (IEC/EN 60335-2-43)   |                 | P       |
|        | Appliances in which the heating unit is located above the textiles are also tested with two layers of textiles placed over the rails. The rails are raised by 50 mm above their normal position or through the maximum distance allowed by the construction, whichever is less (IEC/EN 60335-2-43) |                 | N/A     |
|        | Appliances incorporating a fan are also tested without the motor operating, the guard or air inlet being uncovered (IEC/EN 60335-2-43)   |                 | N/A     |
|        | Wall-mounted appliances which are folded when stored are also tested in the folded position without textiles (IEC/EN 60335-2-43)   |                 | N/A     |
| 19.3   | Test of 19.2 repeated; test voltage (V): power input of 1,24 times rated power input .....   | 1116W           | P       |
| 19.4   | Test conditions as in cl. 11, any control limiting the temperature during tests of cl. 11 short-circuited  |                 | N/A     |
| 19.5   | Test of 19.4 repeated on Class 0I and I appliances with tubular sheathed or embedded heating elements. No short-circuiting, but one end of the element connected to the elements sheath  |                 | N/A     |
|        | The test repeated with reversed polarity and the other end of the heating element connected to the sheath  |                 | P       |

| Clause  | Requirement - Test  | Result - Remark | Verdict |
|---------|---|-----------------|---------|
|         | The test is not carried out on appliances intended to be permanently connected to fixed wiring and on appliances where an all-pole disconnection occurs during the test of 19.4   |                 | N/A     |
| 19.6    | Appliances with PTC heating elements tested at rated voltage, establishing steady conditions  |                 | N/A     |
|         | The working voltage of the PTC heating element is increased by 5 % and the appliance is operated until steady conditions are re-established. The voltage is then increased in similar steps until 1,5 times working voltage or until the PTC heating element ruptures |                 | N/A     |
| 19.11   | Electronic circuits, compliance checked by evaluation of the fault conditions specified in 19.11.2 for all circuits or parts of circuits, unless they comply with the conditions specified in 19.11.1   |                 | N/A     |
|         | Appliances incorporating a protective electronic circuit subjected to the tests of 19.11.3 and 19.11.4 (IEC/EN 60335-1/A1)  |                 | N/A     |
|         | Appliances having a switch with an off position obtained by electronic disconnection, or a switch placing the appliance in a stand-by mode, subjected to the tests of 19.11.4 (IEC/EN 60335-1/A1)   |                 | N/A     |
|         | Appliances incorporating an electronic circuit that relies upon a programmable component to function correctly, subjected to the test of 19.11.4.8 (IEC/EN 60335-1/A2)  |                 | N/A     |
| 19.11.1 | Before applying the fault conditions a) to f) in 19.11.2, it is checked if circuits or parts of circuit meet both of the following conditions:  |                 |         |
|         | - the electronic circuit is a low-power circuit, that is, the maximum power at low-power points does not exceed 15 W according to the tests specified   |                 | N/A     |
|         | - the protection against electric shock, fire hazard, mechanical hazard or dangerous malfunction in other parts of the appliance does not rely on the correct functioning of the electronic circuit   |                 | N/A     |
| 19.11.2 | Fault conditions applied one at a time, the appliance operated under conditions specified in cl. 11, but supplied at rated voltage, the duration of the tests as specified:   |                 |         |
|         | a) short circuit of functional insulation if clearances or creepage distances are less than the values specified in 29  |                 | N/A     |
|         | b) open circuit at the terminals of any component   |                 | N/A     |
|         | c) short circuit of capacitors, unless they comply with IEC 60384-14  |                 | N/A     |

| Clause  | Requirement - Test   | Result - Remark | Verdict |
|---------|--|-----------------|---------|
|         | d) short circuit of any two terminals of an electronic component, other than integrated circuits. This fault condition is not applied between the two circuits of an optocoupler                                   |                 | N/A     |
|         | e) failure of triacs in the diode mode   |                 | N/A     |
|         | f) failure of an integrated circuit (IEC/EN 60335-1/A1)  |                 | N/A     |
|         | g) failure of an electronic power switching device (IEC/EN 60335-1/A2)   |                 | N/A     |
| 19.11.3 | If the appliance incorporates a protective electronic circuit which operates to ensure compliance with clause 19, the relevant test is repeated with a single fault simulated, as indicated in a) to f) of 19.11.2 |                 | N/A     |
|         | During and after each test the following is checked:   |                 |         |
|         | - the temperature rise of the windings do not exceed the values specified in table 8   |                 | N/A     |
|         | - the appliance complies with the conditions specified in 19.13  |                 | N/A     |
|         | - any current flowing through protective impedance not exceeding the limits specified in 8.1.4   |                 | N/A     |
|         | If a conductor of a printed board becomes open-circuited, the appliance is considered to have withstood the particular test, provided all three of the following conditions are met:                               |                 |         |
|         | - the material of the printed circuit board withstands the burning test of annex E   |                 | N/A     |
|         | - any loosened conductor does not reduce the clearances or creepage distances between live parts and accessible metal parts below the values specified in cl. 29   |                 | N/A     |
|         | - the appliance withstands the tests of 19.11.2 with open-circuited conductor bridged  |                 | N/A     |
| 19.11.4 | Appliances having a switch with an off position obtained by electronic disconnection, or (IEC/EN 60335-1/A1)   |                 | N/A     |
|         | a switch that can be placed in the stand-by mode, (IEC/EN 60335-1/A1)  |                 | N/A     |
|         | subjected to the tests of 19.11.4.1 to 19.11.4.7 (IEC/EN 60335-1/A1)   |                 | N/A     |
|         | Appliances incorporating a protective electronic circuit subjected to the tests of 19.11.4.1 to 19.11.4.7, except that (IEC/EN 60335-1/A1)   |                 | N/A     |
|         | Appliances operated for 30 s or 5 min during the test of 19.7 are not subjected to the tests for electromagnetic phenomena. (IEC/EN 60335-1/A1)  |                 | N/A     |

| Clause    | Requirement - Test  | Result - Remark      | Verdict |
|-----------|---|----------------------|---------|
|           | Appliances having a device with an off position obtained by electronic disconnection, or  |                      | N/A     |
|           | a device that can be placed in the stand-by mode,   |                      | N/A     |
|           | subjected to the tests of 19.11.4.1 to 19.11.4.7 (IEC/EN 60335-1/A2)  |                      | N/A     |
| 19.11.4.1 | The appliance is subjected to electrostatic discharges in accordance with IEC 61000-4-2, test level 4 (IEC/EN 60335-1/A1)   |                      | N/A     |
| 19.11.4.2 | The appliance is subjected to radiated fields in accordance with IEC 61000-4-3, test level 3 (IEC/EN 60335-1/A1)  |                      | N/A     |
| 19.11.4.3 | The appliance is subjected to fast transient bursts in accordance with IEC 61000-4-4, test level 3 or 4 as specified  |                      | N/A     |
| 19.11.4.4 | The power supply terminals of the appliance subjected to voltage surges in accordance with IEC 61000-4-5, test level 3 or 4 as specified (IEC/EN 60335-1/A1)  |                      | N/A     |
|           | Earthed heating elements in class I appliances disconnected   |                      | N/A     |
| 19.11.4.5 | The appliance is subjected to injected currents in accordance with IEC 61000-4-6, test level 3 (IEC/EN 60335-1/A1)  |                      | N/A     |
| 19.11.4.6 | The appliance is subjected to voltage dips and interruptions in accordance with IEC 61000-4-11 (IEC/EN 60335-1/A1)  |                      | N/A     |
|           | The appliance is subjected to the Class 3 voltage dips and interruptions in accordance with IEC 61000-4-11 (IEC/EN 60335-1/A2)  |                      | N/A     |
| 19.11.4.7 | The appliance is subjected to mains signals in accordance with IEC 61000-4-13, test level class 2   |                      | N/A     |
| 19.11.4.8 | The appliance is supplied at rated voltage and operated under normal operation. After 60s the power supply is reduces to a level such that the appliance ceases to respond or a programmable component cease to operate (IEC/EN 60335-1/A2)   |                      | N/A     |
| 19.12     | If the safety of the appliance for any of the fault conditions specified in 19.11.2 depends on the operation of a miniature fuse-link complying with IEC 60127, the test is repeated, measuring the current flowing through the fuse-link; measured current (A); rated current of the fuse-link (A) ..... : |                      | N/A     |
| 19.13     | During the tests the appliance does not emit flames, molten metal, poisonous or ignitable gas in hazardous amounts  |                      | P       |
|           | Temperature rises not exceeding the values shown in table 9   | (See appended table) | P       |

| Clause | Requirement - Test   | Result - Remark | Verdict |
|--------|--|-----------------|---------|
|        | Temperature rise of the textiles not exceeding 150 K (IEC/EN 60335-2-43)   |                 | P       |
|        | The textiles are not be significantly scorched (IEC/EN 60335-2-43)   |                 | P       |
|        | Enclosures not deformed to such an extent that compliance with cl. 8 is impaired   |                 | P       |
|        | If the appliance can still be operated it complies with 20.2   |                 | N/A     |
|        | Insulation, other than of class III appliance, withstand the electric strength test of 16.3, the test voltage specified in table 4:  |                 |         |
|        | - basic insulation .....   | 1000V/min       | P       |
|        | - supplementary insulation.....  |                 | N/A     |
|        | - reinforced insulation .....  |                 | N/A     |
|        | After operation or interruption of a control, clearances and creepage distances across the functional insulation withstanding the electric strength test of 16.3. the test voltage being twice the working voltage (IEC/EN 60335-1/A2) |                 | P       |
|        | The appliance does not undergo a dangerous malfunction, and (IEC/EN 60335-1/A1)  |                 | N/A     |
|        | no failure of protective electronic circuits, if the appliance is still operable (IEC/EN 60335-1/A1)   |                 | N/A     |
|        | Appliances tested with an electronic switch in the off position, or in the stand-by mode (IEC/EN 60335-1/A2) :   |                 | N/A     |
|        | - do not become operational, or  |                 | N/A     |
|        | - if they become operational, do not result in a dangerous malfunction during or after the tests of 19.11.4  |                 | N/A     |
|        | Appliances tested with an electronic switch in the off position or in the stand-by mode, do not become operational (IEC/EN 6033-1/A1)  |                 | N/A     |
| 19.14  | Appliances operated under the conditions of Clause 11. Contactors or relays contacts operating under the conditions of clause 11 short-circuited (IEC/EN 60335-1/A2)   |                 | N/A     |
| 19.101 | Appliance operated at 1,24 times rated input with thermal controls short-circuited as specified. (IEC/EN 60335-2-30)   |                 | N/A     |
| 19.102 | Circular and similar portable heater in most unfavourable position at 1,24 times rated input. (IEC/EN 60335-2-30)  | 1116W           | P       |

| Clause | Requirement - Test   | Result - Remark | Verdict |
|--------|--|-----------------|---------|
| 19.103 | Tests specified for heaters other than for mounted at high level, visibly glowing radiant heaters and portable fan heaters: (IEC/EN 60335-2-30)  |                 |         |
|        | - are operated with appliance covered  |                 | P       |
|        | - maximum temperature rise of strips shall not exceed 150 K, overshoot of 25 K allowed during first hour.  |                 | P       |
| 19.104 | Built-in heaters: special conditions as specified. (IEC/EN 60335-2-30)   |                 | N/A     |
|        | Maximum temperature rise of strips shall not exceed 150 K, overshoot of 25 K allowed during first hour.  |                 | N/A     |
| 19.105 | Heaters having a liquid container to be filled by the user: tests specified in Clause 11 with the container empty. (IEC/EN 60335-2-30)   |                 | N/A     |
| 19.106 | Fan heaters: tests of Clause 11 with the rotor locked and the supply voltage equal to the rated voltage. (IEC/EN 60335-2-30)   |                 | N/A     |
|        | Insulation of motor windings ... : (IEC/EN 60335-2-30)   |                 | N/A     |
|        | Temperature of the windings does not exceed the values shown in the table ; temperature (K) ..... : (IEC/EN 60335-2-30)  |                 | N/A     |
| 19.107 | Fan heaters with an enclosure which is of non-metallic material tested with motor and heating element supplied separately (IEC/EN 60335-2-30)  |                 | N/A     |
| 19.108 | Portable fan heaters: tests specified in Clause 11 at 1,15 times rated input. Test made with a sheet of paper for 4 h. (IEC/EN 60335-2-30)   |                 | N/A     |
| 19.109 | Portable fan heaters tested with air stream directed against wall at 1,15 times rated input and with thermal controls short-circuited as specified. (IEC/EN 60335-2-30)                    |                 | N/A     |
|        | Maximum temperature rise on the wall does not exceed 150 K   |                 | N/A     |
| 19.110 | Portable visibly glowing radiant heater tested at 1.15 times rated input, with radiation directed against a wall (IEC/EN 60335-2-30)   |                 | N/A     |
|        | Maximum temperature rise on the wall does not exceed 70 K.   |                 | N/A     |
| 19.111 | Visibly glowing radiant heater at rated input with a piece of flannelette in close contact with the fireguard. The flannelette does not smoulder or ignite within 10 s (IEC/EN 60335-2-30) |                 | N/A     |
|        | The flannelette does not smoulder or ignite within 10 s  |                 | N/A     |

| Clause | Requirement - Test   | Result - Remark | Verdict |
|--------|--|-----------------|---------|
| 19.112 | Portable heater tested in overturned position on a wooden surface covered with cotton gauze, at 1.15 times rated input. Neither cotton gauze nor wooden surface ignite or smoulder during the test. (IEC/EN 60335-2-30)                |                 | N/A     |
|        | Temperature of surface of oil-filled radiators shall be at least 40 K of boiling-point of the oil.   |                 | N/A     |
|        | No deformation of container, no leakage of oil or emission of flames   |                 | N/A     |
| 19.113 | Fan heaters with a non-metallic enclosure: test specified in Clause 11, except that all self-resetting thermal cut-outs and thermostats are inoperative and the fan motor is stalled (IEC/EN 60335-2-30)                               |                 | N/A     |
| 19.114 | A quantity of oil is drained from the container (IEC/EN 60335-2-30)  |                 | N/A     |
|        | Test specified in Clause 11 but at rated power input.  |                 | N/A     |
|        | Temperature of surface of container shall be at least 40 K of boiling-point of the oil.  |                 | N/A     |
| 27     | <b>PROVISION FOR EARTHING</b>  |                 |         |
| 27.1   | Accessible metal parts of Class 0I and I appliances, permanently and reliably connected to an earthing terminal or contact of the appliance inlet  |                 | P       |
|        | Earthing terminals not connected to neutral terminal   |                 | P       |
|        | Class 0, II and III appliance have no provision for earthing   |                 | N/A     |
|        | Safety extra-low voltage circuits not earthed, unless protective extra-low voltage circuits  |                 | N/A     |
| 27.2   | Clamping means adequately secured against accidental loosening   |                 | P       |
|        | Terminals used for the connection of external equipotential bonding conductors allow connection of conductors of 2,5 to 6 mm <sup>2</sup> , and  |                 | N/A     |
|        | do not provide earthing continuity between different parts of the appliance  |                 | N/A     |
|        | Conductors cannot be loosened without the aid of a tool  |                 | P       |
| 27.3   | For detachable parts that are plugged into another part of the appliance, and having an earth connection, the earth connection made before and separated after current-carrying connections when removing the part (IEC/EN 60335-1/A1) |                 | P       |
|        | For appliances with supply cord, current-carrying conductors become taut before earthing conductor, if the cord slips out of the cord anchorage  |                 | N/A     |

| Clause | Requirement - Test   | Result - Remark | Verdict |
|--------|--|-----------------|---------|
| 27.4   | No risk of corrosion resulting from contact between metal of earthing terminal and other metal   |                 | P       |
|        | Adequate resistance to corrosion of coated or uncoated parts providing earthing continuity, other than parts of a metal frame or enclosure   |                 | P       |
|        | Parts of steel providing earthing continuity provided at the essential areas with an electroplated coating, thickness at least 5 $\mu\text{m}$   |                 | P       |
|        | Adequate protection against rusting of parts of coated or uncoated steel, only intended to provide or transmit contact pressure  |                 | P       |
|        | In case of aluminium alloys precautions taken to avoid risk of corrosion   |                 | N/A     |
| 27.5   | Low resistance of connection between earthing terminal and earthed metal parts   |                 | P       |
|        | This requirement does not apply to connections providing earthing continuity in the protective extra-low voltage circuit, provided that clearances of basic insulation are based on the rated voltage of the appliance |                 | N/A     |
|        | Resistance not exceeding 0,1 $\Omega$ at the specified low-resistance test   | 0,032 $\Omega$  | P       |
| 27.6   | The printed conductors of printed circuit boards shall not be used to provide earthing continuity in hand-held appliances. (IEC/EN 60335-1/A2)   |                 | N/A     |
|        | They may be used to provide earthing continuity in other appliances if at least two tracks are used with independent soldering points and the appliance complies with 27.5 for each circuit (IEC/EN 60335-1/A2)        |                 | N/A     |
|        | The printed conductors of printed circuit boards not used to provide earthing continuity in hand held appliances   |                 | N/A     |
|        | They may be used in other appliances if:   |                 |         |
|        | - at least two tracks are used with independent soldering points and the appliance complies with requirements of 27.5 for each circuit   |                 | N/A     |
|        | - the material of the printed circuit board complies with IEC 60249-2-4 or IEC 60249-2-5   |                 | N/A     |



| 10.1                   | TABLE: Power input deviation |                |       |             |        | P |
|------------------------|------------------------------|----------------|-------|-------------|--------|---|
| Input deviation of/at: | P rated (W)                  | P measured (W) | Dp    | Required Dp | Remark |   |
| type KL- E 1830.1000   | 900                          | 903            | +0,4% | +5%         | P      |   |
|                        |                              |                |       |             |        |   |
|                        |                              |                |       |             |        |   |

| 11.8                                 | TABLE: Heating test, thermocouples |                          |             |           | P |
|--------------------------------------|------------------------------------|--------------------------|-------------|-----------|---|
|                                      | Test voltage (V) .....             | 247,5 V<br>11.101 - 230V |             | —         |   |
|                                      | Ambient (°C) .....                 | 21                       |             | —         |   |
| Thermocouple locations               | dT (K)                             | (°C)                     | Max. dT (K) | Max. (°C) |   |
| supply cord                          | 24                                 |                          | 50          | 75        |   |
| internal wiring                      | 60                                 |                          | 145         | 170       |   |
| ambient of thermal cut-out ( T 110 ) | 60                                 |                          | 85          | 110       |   |
| metal enclosure                      | 42                                 |                          | 85          | 110       |   |
| test corner                          | 14                                 |                          | 60          | 85        |   |
| textile material                     | 54                                 |                          | 75          | 100       |   |
| painted metal surfaces ( 11.101 )    | 40                                 |                          | 60          | 85        |   |

| 13.2                     | TABLE: Leakage current   |                     |  | P |
|--------------------------|--|---------------------|--|---|
|                          | Heating appliances: 1.15 x rated input.....                          | 1035W               |  | — |
|                          | Motor-operated and combined appliances:<br>1,06 x rated voltage..... | —                   |  | — |
| Leakage current between: | I (mA)   | Max. allowed I (mA) |  |   |
| Live parts and the body  | 0,034  | 0,75                |  |   |
|                          |  |                     |  |   |

| 13.3                          | TABLE: Electric strength |                    | P |
|-------------------------------|--------------------------|--------------------|---|
| Test voltage applied between: | Voltage (V)              | Breakdown (Yes/No) |   |
| Live parts and the body       | 1000V/min                | No                 |   |
|                               |                          |                    |   |
| supplementary information:    |                          |                    |   |

| 19.13                  | TABLE: Abnormal operation, temperature rises |      |             |           | P |
|------------------------|--|------|-------------|-----------|---|
| Thermocouple locations | dT (K)                                       | (°C) | Max. dT (K) | Max. (°C) |   |
| Test corner            | 21   | 43   | 150         | 175       |   |
| Supply cord            | 44   | 66   | 150         | 175       |   |
| felt ( cl.19.103 )     | 73   | 95   | 150         | 175       |   |
| textile material       | 62   | 84   | 150         | 175       |   |

| 24.1   | TABLE: Components          |              |                       |  |                                 | P |
|--|----------------------------|--------------|-----------------------|--|---------------------------------|---|
| Object / part No.                            | Manufacturer/<br>trademark | Type / model | Technical data        | Standard                                   | Mark(s) of<br>conformity        |   |
| Supply cord                                  | KABLO<br>ELEKTRO-VM        | H05VV-F      | 3x0,75mm <sup>2</sup> | 60227 IEC 53                               | EZU, VDE                        |   |
| Heating element                              | TRADEKO                    | EI.05MgO     | 500W 230V~<br>IP 44   | IEC 60335-1<br>IEC 60335-30                | Tested with<br>the<br>appliance |   |
| self-resetting<br>thermal cut-outs           | Thermik<br>Gerätebau GmbH  | SR6 1005     | 10 A 230 V~           | EN 60730-1<br>EN 60730-2-2<br>EN 60730-2-9 | VDE                             |   |
| self-resetting<br>thermal cut-outs<br>(alt.) | UCHIYA<br>Thermostat Co.   | EP42P        | 5 A 250 V~<br>110°C   | EN 60730-1<br>EN 60730-2-2<br>EN 60730-2-9 | VDE, UR                         |   |
|  |                            |              |                       |  |                                 |   |

<sup>1)</sup> An asterisk indicates a mark which assures the agreed level of surveillance

END OF TEST REPORT

  
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